Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 6.] NEW-YORK, SEPTEMBER 28, 1850. [NUMBER 2.

THE SCIENTIFIC AMERICAN,
Published Weekly, at 128 Fulton, street, N. Y., by
MUNN & CO.,
At $2 a-year; $1 for 6 months---in advance.

Rail-Road News.

Another Splendid Locomotive.

The Baltimore and Susquehanna Railroad, says the Baltimore Sun, have, within the last few days, turned out another splendid locomotive, from their shop at Bolton Depot, under the superintendence of Mr. G. Denmead, master of machinery. This engine is called the "York," and is finished in all particulars in first rate style. It has four drivers, five feet in diameter, driven by cylinders fourteen inches in diameter, and eighteen inches stroke. The principal feature in the construction of this engine consists in an improved valve gear, designed by George W. Fulton, of our city. By this contrivance, the whole control of the engine, viz.: stopping, starting, backing, as well as regulating the speed in either direction, is concentrated in one handle. This arrangement requires the eccentric to be set "without lead," the valve is so arranged that a portion of the exhaust steam is received into the opposite end of the cylinder, and immediately cut off there, fulfilling all the purposes of "the lead," and further saving that portion of steam usually lost in the side pipe and clearance of the cylinder. Another advantage consists in the saving of the wear of the valve in running down grade, as it can instantly be made motionless, without throwing out of gear, as is usually the case. In reversing the engine this gear acts without a jar or concussion of any kind, as by merely moving the bar from one extreme to the other, the steam is gradually shut off, and as gradually let on to the opposite side of the piston. The "York" is undoubtedly an A, No. 1 engine, highly creditable to the company and all concerned in its construction.

Baird's Spark Arrester.

A friend writes us that an application is now pending for a renewal of French & Baird's patent on a "Spark Arrester;" he thinks it should not be renewed, because they have made over 600 pipes and realized about $50 on each. He also states that the unexpired term of the patent has been sold for $15,000, which is a fair remuneration for the invention—making in all about $45,000.

Sale of the Franklin Railroad.

We learn that the Franklin Railroad—a line extending from the town of Chambersburg in Pennsylvania, to the Maryland line, and thence to the flourishing town of Hagerstown—a distance of about fifteen miles,—together with all its chartered privileges, is to be sold. This road passes through a very rich country.

Central Railroad.

By an advertisment in the Pittsburg Gazette all the sections remaining unlet on the line of the Pennsylvania Railroad, between Pittsburg and Johnstown, are to be given to contractors on the 10th of October next. The whole line will be then under contract except a part of the mountain section, for which the Portage Railroad can be substituted until it is finished.

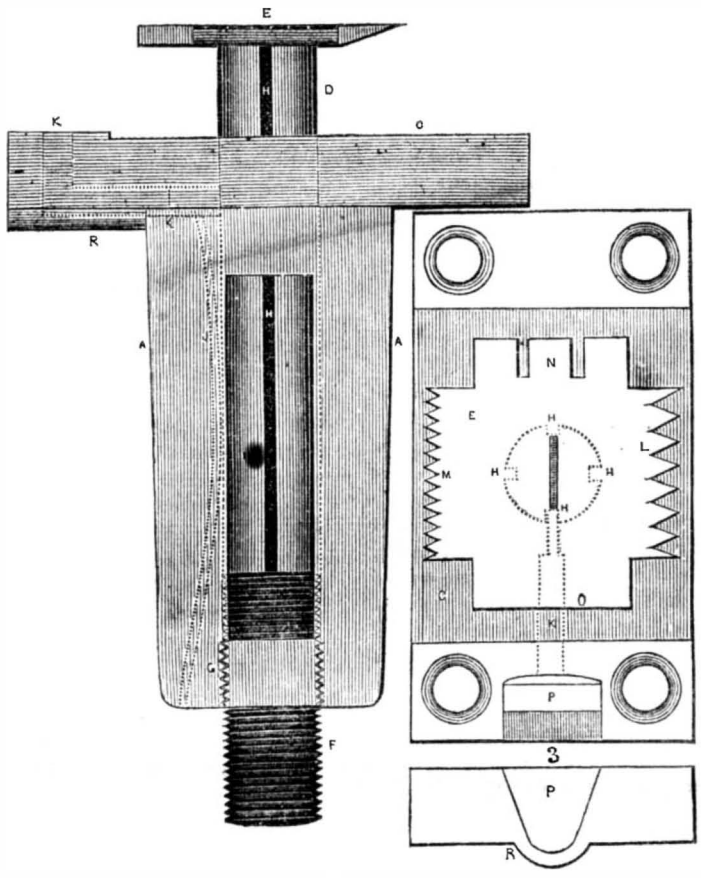
The First Railroad in Wisconsin

The Milwaukie and Mississippi road had the first rails laid on the 12th inst.

Two locomotive engines for passenger trains on the Central Railroad, arrived at Savannah on the 17th inst.

CARPENTERS' IMPROVED BENCH HOOK.

Figure 1. Figure 2.

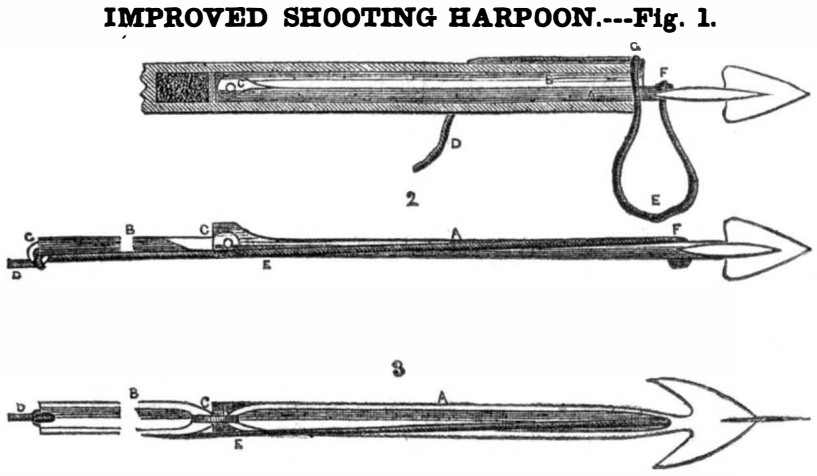


This is an improvement on the "Bench Hook" invented by Mr. W. B. Kean, of New Wercester, Mass., and secured to him by patent on the 19th of last month. The bench hook has four edges, and is capable of being turned easily in the bench, to present any one of the four edges, to hold different kinds of work—rough or smooth.

Figure 1 is a vertical elevated section, and figure 2 is a plan view (looking down on the top of the bench.) The same letters refer to like parts. A is a bolster of the work-bench; C is a plate of metal screwed down on the deck of the bench; E is the head of the bench hook, and D is its shank. Its shank is a strong screw bolt, with four slots cut in it, (one, H, being shown in fig. 1.) There is a slot for each edge of the hook, E. The screw, F, of the bench hook works into a thread, G, in the bolster of the bench, so that it can be raised to any height, for the planing of thick, or lowered for the planing of very thin pieces; O is a plane edge of the bench hook for holding smooth work, like cabinet maker's, and L M N are serated edges for holding work of different kinds, hard, &c. Figure 2 shows the three notches in the screw bolt, D, of the hook; these notches receive a spring, K, which projects into each notch for each edge, as it is turned round; J is the plate of this spring extending downwards, to give the tension of the spring a direction inwards, to catch into each notch, H, as the bolt is turned round. The bench hook cannot be moved without this spring is drawn back; this is done by pulling on the head, P, of the catch spring, K. Figure 3, below figure 2, is an end view of the plate or flange, C, and R is a little rib on the bottom of the said plate. There is a small space behind the head of the catch (P, fig. 2) which allows the spring to be drawn back, to enable any edge of the hook to be turned round.

This bench hook is a good improvement; it is useful for workers in both fine and coarse work, and will, no doubt, soon come into general use. More information may be obtained by letter, addressed to Mr. Kean.

IMPROVED SHOOTING HARPOON.---Fig. 1.



This instrument is the invention of Mr. Wm Albertson, of New London, Conn., who has taken measures to secure it by patent.

Figure 1 is a longitudinal section, showing the harpoon in the inside of the gun-barrel; figure 2 is a side view of the harpoon, and figure 3 is a plan view of it, showing its joint. The same letters refer to like parts.

The object of this harpoon is, in forming the shank with a joint at its middle part, so that it can be folded up, and the extremity be at the mouth of the barrel—the line being there attached to it, so that the line does not enter the barrel at all. The head is double, the one set at right angles to the other, as the three engravings set forth. A is the front half of the shank and B the back half; the two halves are the same length, and figures 2 and 3 are broken at B B, to show that they are longer than represented; C is the joint—this allows B to fold over on to A, and form a round shank. Both parts of the shank are hollow for lightness, and when folded over in the gun, they form a tube; the joint is peculiarly formed, as shown by the concave part, which allows C to fold over and present a plane butt to the action of the charge; E is the line, it passes through an eye in the neck, at F, and through a ring in the extremity of the shank at G, and D is that part of it running back from the shank: it is represented as ready for firing off in fig. 1. When the harpoon is shot out of the gun, the two halves of the shank open, and the drag on the back extremity gradually straightens out, darting forward in the position represented by figures 2 and 3, to strike the monster of the deep. We had supposed that the wearing of the back half of the shank, from being folded up to its greatest length, would have changed it from the direction of its impulse, but Mr. Albertson states that it has been tried, and that it operates in whaling perfectly true and correct in every respect. Experiment is the real test of the correctness or incorrectness of the operation of any instrument, and as Mr. Albertson has given it a fair trial, the proof of its utility is not problematical, but it is actually a good improvement.

Skill of Dentists.

Our readers may well remember the imputations which were thrown upon the testimony of Dr. Keep, of Boston, and his student, in reference to their positive identification of Dr. Parkman's teeth. The result of that lamentable affair has added no small degree of importance to the value of mechanical knowledge in a legal point of view. The testimony was the most direct of any, and so it was in another case, that of the Mannings, in England. In the latter case, the victim, O'Connor, wore a set of artificial teeth, and the dentist hearing of it, the teeth were shown to him, recognised, and applied to the working model; thus proving beyond a doubt that it was the same individual who had been murdered, viz., O'Connor—the rest of his body not being recognizable. The recognition and identification by the gentleman who had made and adapted the teeth, followed as a matter of course, and a most important link in the chain of evidence was thus obtained.

In the case of Dr. Parkman, the bones of the cranium had been calcined by throwing them into a furnace, the ashes of which were examined; and amongst them, artificial mineral teeth were found mounted upon gold, which could not be destroyed. Inquiry was made amongst the dentists, and Dr. Keep, a celebrated dentist of the place, instantly identified the work, placed them upon his working model, and at once supplied an important link of evidence, he having made the teeth a few months previously. These instances, out of many that might be cited, are interesting, as showing how important and intimate a connection there exists between a proper knowledge of the practical and mechanical department of the dental art, and its application as an auxiliary of medical jurisprudence, in which it can be rendered subservient to further the ends of justice.

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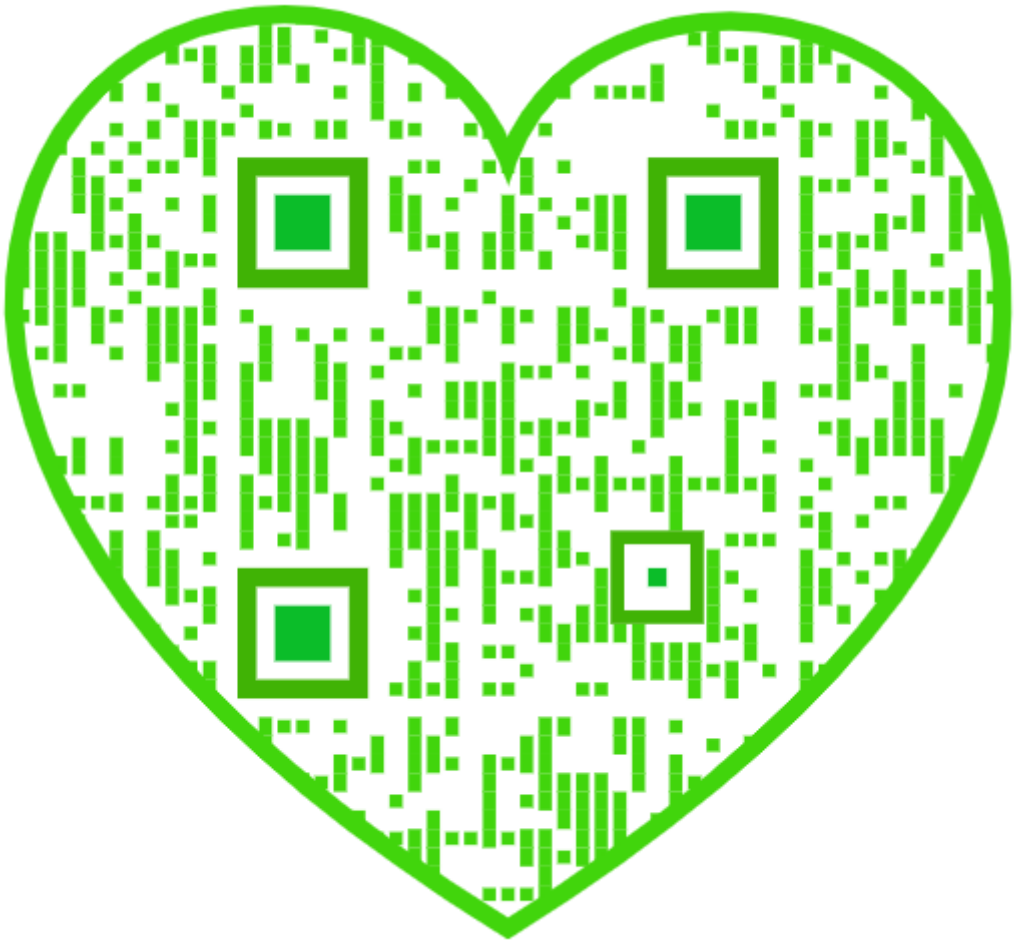

Miscellaneous.

British Association for the Advancement of Science.

We will now proceed to give a condensed abstract of such proceedings of this Association, as we think will be of most interest to the majority of our readers. The Association held its meetings in Edinburgh, Scotland, (where it first originated), in the early part of last month. Sir David Brewster delivered the opening address. We are principally indebted to that able paper, "The Glasgow Daily Mail," for an excellent report of the proceedings. The whole of our extracts will be found to possess a value which, when bound up in the Scientific American, will be like golden coin well invested. Let every one read them, for in this country, where there are so many changes in business, in the course of a life, if it does not be of use to a subscriber now, it may be of use next year, and if not next year, it may at some other time.

ECONOMICAL USE OF THE GASEOUS ESCAPE FROM BLAST FURNACES AT IRON WORKS.

Mr. Budd stated that, since the meeting of the Association at Swansea, he had continued, and with increased success, to apply the waste gases that escaped from the top of blast furnaces to the manufacture of iron; and it was the result of his farther experience applied to the whole of his furnaces (nine in number) since that period, that he now wished to submit to the section. He considered that he could not have fallen on a better locality for this purpose than Scotland, where the iron trade has been developed with a rapidity that is quite surprising, and quite characteristic of the enterprise of Scotchmen. Twenty-five years ago, Scotland was of no importance in the iron trade, but, since then, the produce of iron in Scotland had increased to between six and seven hundred thousand tons a-year. In that short period Scotland had accomplished a production which Staffordshire and other places in England took two hundred years and South Wales a hundred years to accomplish—the make of iron in Scotland being now equal to that of either England or Wales. This great accession to the produce of iron has had a most sensible effect on its price; but as he believed that necessity was the mother of invention, and that nature had in store for us an immense reservoir of riches to be yet developed, he was of opinion that the tendency of all this cheapness was to teach us that nothing should be wasted, and that we should look forward to the time when the smoke that at present contaminated the atmosphere, and the filth that polluted our streets, would be regarded as too valuable to be wasted. When we considered the utility of iron, its low price, and its general distribution in the deposits of every age, we could not but look at it otherwise than as the great agent in modern civilization. Mr. Budd then referred to his mode of applying the gaseous escape, and said it was well known that there were two descriptions of furnaces used for metallurgic purposes. The one was the blast furnace into which air was injected, by mechanical means, at a great density, so as to penetrate upwards of forty feet of dense materials; and the other was the reverberatory furnace, where the fire was produced by means of a draft of a chimney stack. What he had accomplished was by combining these two, so that the gaseous products of the furnace, instead of escaping through the tunnel head, were drawn sideways by a high stack, and passing through the stoves and boilers, leave behind the necessary temperature of the blast and of the steam. In a blast furnace the ores are smelted before the tuyeres by the conversion of the solid carbon into carbonic acid, which, passing up through the middle region of the furnace into a bath of carbon, was re-converted into carbonic oxide, capable of combining with a farther dose of oxygen. It would be thus seen that the whole of the carbon of the fuel should be present at the top of the furnace in a gaseous form. When the British Association met a Swansea, he had not used the gaseous escape at any great distance from the furnace, his stoves and boilers being very closely contiguous. Further experience, however, had proved that by the aid of the stack at the end of the chain of sufficient dimensions, the gaseous escape from the furnace might be made to travel in the most tortuous directions, descending to the stove built for heating by the usual fire-places and traversing the boilers; the only condition absolutely necessary being that there should be an unbroken communication with the high stack at the end, into which the gaseous escape might at last pass, and by which it was drawn forward, instead of passing off wastefully at the tunnel-head. When, however, the draft was carried downward, and to long distances, he had found it necessary to drop into the top of the furnace a hopper or funnel, made of sheet-iron, which acted as a shield at the mouths of the horizontal flues, and prevented them from either being affected by high winds, or from being choked up by materials thrown into the furnace. The reason, no doubt, why this funnel was not applied before, was the great apparent temperature at the tunnel head. In practice, however, it was found that, until the gaseous escape mingled with the atmosphere, its heating power was not such as to injure sheet-iron, or even to make it red hot. In fact, so long as there was an escape upwards, the iron funnel would not be injured. The damage arose during and after stoppages of the furnace, when the blast was obstructed in its passage upwards by the settlement of the materials in the furnace, so that the atmosphere rushed down to meet the ascending gases, and of course caused a very high local temperature. His practice was to seclude the atmospheric air as much as possible. The affinity of the gases for oxygen was so great that the air leakage raised the temperature quite sufficient for safety, whilst the full combustion of the gaseous escape would melt down the bricks in the flues, and destroy the texture of the iron tube. It was not possible for him to say what combinations took place at high temperatures, where carbonic oxide, carbonic acid, hydrogen, and nitrogen, were mixed in such proportions. At any rate, he found a smothered combustion to be the most suitable and economical for the purposes in view. He was quite aware that, by the plan he had pursued, the utmost heat was not extracted from the gases: and that, by different means, a temperature might be obtained capable of performing all the operations of the forge; and if it be true that the solid carbon of the furnace in its escape, as carbonic oxide, would unite with another dose of oxygen for saturation, there could be little doubt that, with properly constituted gas furnaces, there was enough at present passing off to convert the pig iron into bar iron. He was happy to say that, at length, the application of the gaseous escape had been tried in Scotland; and that at Dundyvan and elsewhere it was now in successful operation. The peculiar quality of the furnace coal of Scotland being what was called in South Wales "free-burning," which, when put into the furnace raw, coked sufficiently in its descent, gave out an enormous escape, so much so that, upon a rough estimate, he calculated that the waste from one furnace in Scotland was sufficient to heat a blast, and to raise the steam for three. With anthracite coal, the minimum effect was obtained, and it was a dense fuel of nearly 95 per cent. of solid carbon; but in Scotland there would be an enormous surplus at the tunnel head. He expected from the well-known sagacity of the Scottish people, and when truly embarked in this mode of operation, the greatest possible use would be made of it; and he would not be surprised to see heat let out, like mill-power, for burning bricks and other similar purposes.

THE NUTRITIVE QUALITIES OF FOOD.

Professor Voelcker read a valuable paper "on the per centage of Nitrogen as an index to the nutritive Value of Food." The nutritive value, as determined in this way, he believed to have been considerably overrated, and referred to certain experiments which he had made on fungi, which were remarkable for the quantity of nitrogen, and understood to be highly nutritious. Dr. Christison thanked Professor Voelcker for his paper, and remarked that he had long suspected a fallacy in the method of determining the nutritive value of food as derived from the azote of nitrogen only.

[This is a subject which has caused a great deal of discussion among Professors of "Animal Chemistry." We confess that we are not satisfied with much that is said on the subject—there is a great deal of *darkness visible*,—who will remove the veil?

CHEMICAL ACTION OF SOLAR RADIATION—PHOTOGRAPHY.

Robert Hunt, Esq., read a "Report on the present state of our knowledge of the Chemical Action of Solar Radiations." It was listened to throughout with profound attention. Toward the conclusion of his address, Mr. Hunt referred to a report originating in one of the London prints that the plants in the magnificent new Conservatory at Kew had been scorched by the glass, and that he ought to have made an experiment on a smaller scale before subjecting the nation to so much expense. He begged to say, that after the experience of the summer of this year and the autumn of last year, there have not only been no scorching of the plants, no failure in the glass, but that Sir William Hooker had recommended the adoption of it to others. Mr. Hunt adverted to the interference of light with chemical action, and mentioned that, as we approach the equator from the temperate regions, this becomes most manifest. He had been assured by a gentleman who had resided in Mexico that in the bright season the Calotype and Daguerrotype processes were all but impracticable, but that when the rainy season commenced, and the sky was slightly shaded, the case was different. Under glass of a yellow colour, he remarked, plants would not germinate vigorously as they would when the light passed through a blue medium. He mentioned that in Paris there was a war at present raging, as to the party to whom the honour belonged of the production of an instantaneous photograph. He begged merely to say that a reference to a paper read by him six or seven years ago, on the flurotype, would, he believed, determine the matter. He was able at that time to produce good pictures in 20 seconds, with every ray distinctly impressed.

COAL FIELDS OF SCOTLAND.

Mr. James Bryce, jun., communicated the results of his research in regard to the Lesmahagow and Douglass coal fields, and illustrated his observations by a geological map, and sections and specimens of the fossil remains with which he had met. He gave a short outline of the distribution of coal in Scotland, and showed that, while other coal fields were separated from each other merely by erupted rocks, the field in question was cut off from connection with the rest by ridges of the older rocks rising up all around. The mineral contents of the basin were next described. These, Mr. Bryce said, consisted of very considerable thickness of workable coal, blackband, and clayeyband ironstones, potter's clay, freestone; and almost all of which are largely available for practical purposes.

BLACKBAND IRON STONE.

Dr. Frederick Penny, of the Glasgow Andersonian University, read a paper on a ready method for the determination of Iron in Clayband and Blackband Iron stone. In this process Professor Penny uses the bicromate of potash, which, as well as the neutral chromate, he finds gives very exact results. The chromic acid and protoxide of iron, by which the former becomes sesquioxide of chromium, and the latter sesquioxide of iron. In those cases in which the iron-stone contains peroxide of iron, Dr. Penny recommends the employment of sulphate of soda previous to the application of the bichromate liquor for the purpose of reducing the peroxide to the minimum state of oxidation. Dr. Penny gave the results of numerous experiments which he had performed on metallic iron and the sulphate of iron, with the view of ascertaining the exact proportion of bichromate of potash and metallic iron. As the mean of all his results he gave 88·75 of bichromate of potash to 100 of iron. This mode of analysis he remarked, in conclusion, might be applied to other ores of iron, as well as to the examination of alum and copper, as liquors and other products in the arts.

MAGNETO OPTIC PROPERTIES OF CRYSTALS.

John Tyndell, Esq., read a paper on the magneto-optic properties of crystals. The subject was connected with discoveries made four years ago by Dr. Farraday, regarding diamagnetism, showing that all material substances were divisible in two classes, one of which was attracted by the magnet, as iron, and which were termed magnetic, and the other repelled by it, as bismuth.

Mr. Tyndell was of opinion, from various experiments which he had made, that instead of the assumption of four new forces, an electropolar force was sufficient to account for the phenomena presented by crystals placed between the poles of the magnet.

American Association for the Advancement of Science.

ADULTERATION OF VERMILLION.

Prof. Horsford read a paper on the Adulteration of Vermillion. By the examination of a number of specimens he found that they had been adulterated from one half to two-thirds, and some samples sold for vermillion did not contain a particle of mercury; he found three specimens pure—one from China, one from Trieste, and one American. The adulterations were the chromate of lead and red lead.

CRYSTALS OF OXIDE OF CHROMIUM.

Mr. W. P. Blake exhibited some crystals of great beauty, which had formed in a reverberatory furnace, long used to manufacture the chromate of potash from chrome ore; they were of a deep emerald green, and nearly as hard as the diamond. Mr. B. considered their formation due to the infiltration among the bricks of the fused chromate of potash, by long-continued and uniform heat, and thus the reduction of the chromic acid to the sesquioxide of chromium.

[Will our able cotemporary, the Washington Globe, be pleased to put this along with the Despretz diamond?

MECHANICAL POWERS.

Prof. Henry, of the Smithsonian Institute, went into a dissertation on mechanical powers, which he divided into to classes—attraction and repulsion, which act independently of velocity. Machinery moved by weights, such as a clock, derives its power not from gravity, but extraneous aid. He divided the mechanical powers into two classes, the one derived from celestial disturbance, the other derived from vitality—water-power, tide-power, and wind-power, belong to the first; steam-power and animal-power to the latter. Animal power may be referred to vegetable power, vitality and vital power, however, were different.

Professors Mitchell, Pierce, Bond, Hackly, Bache and Walker, had considerable sharp-shooting about the instrument of Prof. Mitchell, in Cincinnati, for recording astronomical observations.

Mr. J. B. Bunce read an able paper on the amount of alkali and phosphates in coal ashes, and thought they might well be applied to agricultural purposes.

We have now closed our extracts of the proceedings of this respectable Association. We have given but a tithe of the proceedings, but we have given that which we have thought was most useful and interesting to the majority of our readers. A great deal of the proceedings were too speculative for our columns.

Prof. Agassiz was chosen President; we are glad to see this,—the pupil of Cuvier deserves to be honored every where, because he has no superior as a naturalist in the world. Among our scientific men there is more nobility of sentiment than among our politicians. Professor Baird, of the Smithsonian Institute, is permanent Secretary. The semi-annual meeting takes place in Cincinnati next May. The next annual meeting takes place in Albany, N. Y., on the 3rd Monday of August, 1851.

Coal.

It is stated that a vein of bituminous coal has been discovered at Brandon, Vt. We hope this is true, but have strong and well grounded fears that it is not. What has become of the coal mine *discovered* near Albany last year? Will any of our Albany friends explain? As coal is now very high, it would be a good time to open the mine.

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For the Scientific American.

The Voltaic Battery.

NUMBER II.

It is invariably the case that after science has given birth to a new art and nurtured it for a while, that it passes over to the industrial world, where it is baptized in a new name, clothed in a new garb, and set to work. Here the scientific world loses sight of it; all future improvements remain with the artizan. Science feels the alienation and can no longer even correctly describe its offspring;—that which was an experiment of the laboratory or the lecture table, has become a trade.

Electro metallurgy has been described in almost every paper published in the country, and there is not, perhaps, even a village where silvering and gilding has not been attempted by ingenious persons, but it has always failed except to bring an outcry against what is termed galvanizing. This has been because chemists describe an immatured art, in language which one professor of chemistry would use in speaking of another; or the general principles alone were treated of, and scientific technicalities profusely offered in the place of experience.

The electro arts are yet in their infancy, and their importance is but beginning to be appreciated. Silver is the only metal suitable for many table articles, but it is too scarce to be employed generally for this use; but the articles can be made of a metal superior to silver in mechanical properties, and kept plated with pure silver for less than the interest of the money they would cost if made of silver; and the facility with which electro-plating is executed, has entirely changed the method of producing them. Articles greatly excelling in boldness of design and grace of execution, have been so cheapened, that it gives even to the laboring classes an opportunity to possess some specimen of artistic skill to grace the festive board or garnish the picture of home.

The voltaic precipitation of copper is of great importance, for the voltaic metal is not as liable to corrode as the ordinary metal. Culinary articles formed of it must soon take the place of the wretched tin pans, now so generally found in the kitchen. It is highly probable that steam boilers formed of it would not be liable to incrustation, and, from non-corrosion, would last many times longer than those made from impure copper.

The formation of coin from voltaic metal would have such advantages that our government should no longer make cents from any other, for this is the coin generally found in the hands of children, and is handled more, perhaps, than any other; it is constantly gathering a coating of poisonous matter, which readily adheres to the fingers; children frequently put these coins in their mouths, and death has not unfrequently ensued. Cents made of voltaic metal would always remain clean.

The electrotype art is, however, rapidly rising to importance, and its advantages being appreciated; large engraved plates, which have required as much as three years to produce them, are now coming into use; it is known that 1,000 prints from one such plate, if the work is delicate, will wear it out; if the plate has cost $5,000, the 1,000 prints must pay this between them; this would be an insuperable obstacle to this kind of engraving, but the plate can be multiplied to any extent by the electrotype art, and thus any number of prints obtained, without using the original plate to print from.

The voltaic battery is an apparatus used for obtaining an uninterrupted current of electric power.

In the article on the Battery, the best form will be given, together with the relative expense of all the various batteries in use—a description given of the Reservoir Voltaic Battery, in which any amount of the voltaic force can be stowed away and drawn off as wanted, with the certainty and facility that liquid can be retained and drawn from a cask, and which will maintain its action for any length of time—consumes nothing when not in use, and is always ready for use, it not being liable to get out of order until exhausted of material, and which has never before been published.

The art of electro-gilding consists in depositing, on a metallic article, a film of gold of a rich color and firmly adhering to the basis. In the article on Gilding will be given infallible directions for preventing the occurrence of the black deposit, and producing firm adhesion; directions will also be given for producing firm adhesion between the basis and deposited silver, and a method described of making pure cyanide of silver and potassum, free from admixture of potash or its acid salts.

VOLTA.

Compressed Air Engine.

The following is a description of a "Compressed Air Engine," employed near Glasgow, taken from the "Daily Mail" of that city, which is celebrated for manufactures and engineering. The engine is employed in a coal pit of Messrs. Allen & Man, at Little Govan, near Glasgow:

"The compressed air is only employed on this occasion as the most convenient form of transmitting power to a great distance and at a great depth, under ground; and not as a merely economic mode of obtaining or generating power.

The object sought and so successfully applied in the present instance, is the working of winding engines, placed at a depth of nearly 100 fathoms under ground, and at a distance of about half a mile from the pit-mouth, where the steam engine is fixed.

To work an ordinary steam engine at such a depth, and in a remote part of the mine, would be next to impossible and highly dangerous, owing to the inflammable gases in constant course of extrication from the workings, which might at any time explode by coming in contact with the furnace fires of the boiler. Besides, pure air is too valuable down in the galleries and workings of a pit, to have it destroyed or contaminated by the results of combustion from a large steam engine furnace.

Many attempts have been made on the continent and elsewhere to transmit power from a convenient prime mover to long distances, by means of pipes; but the principle almost always adopted was that of exhaustion. Where the distance was great, the result was next to nothing; and even within certain limits, the inward leakage of the pipes in a great measure destroyed the effect of the vacuum obtained by the prime mover.

Another mode is, by employing the pressure of a column of water, instead of steam or compressed air; but the want of elasticity in that fluid operates injuriously upon the working machinery.

It was these considerations which induced the engineers to devise the present most successful effort at overcoming difficulties, hitherto deemed nearly insurmountable.

The apparatus may be divided into two parts—first, the prime mover, which is a non-condensing steam engine, above ground, at the pit-mouth, working two air-pumps for compressing the air; and second, the winding-engine, some 600 feet below the surface, and half a mile away, which receives its power from above ground.

The latter is, in all its parts and details, precisely like a non-condensing steam engine, but only actuated by compressed air, instead of steam. This engine is employed in winding the coals from workings at a still lower depth than the main pit.

But it is in the prime mover that the engineers have struck out several new features in the application of scientific mechanics. The engine, which works with steam, at a pressure of 40 lbs. to the inch, has a walking beam, consisting of two plates, about 30 inches apart, rocking in plumber-blocks placed between them, and fixed on the top of a very massive column, about 3½ feet in diameter at the base. The steam-cylinder, of 21 inches diameter, and 42 inches stroke, is at one end of the beam, and the connecting-rod, crank shaft, with fly-wheel, at the other.

There are two inverted air-pumps on either side of the centre, and midway between it and the ends of the beam. They are elevated about 4 feet above the framing, and are both exactly alike. Each piston projects downwards through a stuffing-box in the cylinder cover; and on the end of the piston rod is fixed a cross-head, which is connected with the walking beam by side-rods passing upwards to each leaf.

The column on which the bearing of the walking beam is fixed is hollow, and forms a receptacle for the condensed air before it passes into the exit-pipe; and there are two large ports connecting it with the upper part of each air-pump.

Each air-pump is single-acting, compressing the air only during the upward stroke, and forcing it into the great centre column or air-chamber. Instead of any of the ordinary forms of valve, the engineers designed an extremely simple but effective application of the spherical or ball valve. The pump cover, the piston, and a diaphragm, which is placed a few inches from the top of the pump cylinder, are each perforated with about fifty circular holes, an inch and a half in diameter. In each of these holes a ball rests, ground to fit water-tight, and all opening upwards. As, however, it is of great importance that every inch of compressed air should be ejected at every stroke of the pump, an arrangement is contrived by which a quantity of water, more than equal to the necessary clearance between the piston and the ends of the cylinder, always rests upon the piston, the diaphragm, and the cover—so that every particle of air is expelled at each stroke; and if there is any overplus of water, it finds its way, along with the air, through the air-port into the air-chamber, whence it is forced by the pressure of the condensed air, through a small pipe, back to the piston, during the return stroke. The air is condensed to a pressure of 30 lbs. on the inch; and the contents of the pipes, extending to the winding-engine, below, are sufficient to keep it at work for several minutes: but the engine man takes care that the pressure is always kept up in the air-pipes; and as soon as it begins to blow off from a safety-valve in the engine-room, the pumping is discontinued. The air-pipe is ten inches diameter, and, passing down the shaft, is carried along a horizontal gallery for half a mile, until it is connected with the winding-engine; but there is sufficient capacity and power to work several winders, which will be added as the mine extends in the new workings."

This engine was constructed by Messrs. Randolph, Elliott & Co., engineers, Glasgow. The air-engine is kept in a room cut out of the solid rock, 600 feet distant from the pit bottom.

Foreign Correspondence.

GLASGOW, Sept. 6, 1850.

The trial of the Captain and two mates of the steamship Orion, for the loss of that vessel at Portpatrick, as previously stated, occupied the High Court of Justiciary, at Edinburgh, for three days of last week, and closed with a verdict of "guilty," against the Capt. and Second Mate. The First Mate was discharged, as the accident did not occur during his watch, and sentence of eighteen months imprisonment was passed on the captain, and seven years' transportation for the second mate. I cannot rest pitulate the voluminous evidence. The result establishes the principle of the captain's responsibility during the entire voyage, which may, on an average, occupy twenty hours. He was in his cabin, and is imprisoned, because, being in good health, he should have been on deck. The second mate was in charge; his conduct was inexplicable: two seamen warned him that he was too near the shore; the vessel struck within two hundred yards of it. One experienced captain said he always kept off one and a half miles. Others alledged that they might pass safely within half a mile. It was put in as palliation, that the night was obscured by a fog, which was not true, as the ship was seen by men from the land, and others on the ship observed the land. Then it was alledged for the second mate, that he shaped his course by the binnacle compass, which was found not to agree with another ship's compass, in consequence, as is thought, of iron being stowed in the afterhold; and it was also argued that the influence of iron ships on the accuracy of the compass was not fully understood. All these statements may be true, but a man's eyes are preferable to his compasses—so thought the jury.

We shall have a trial of a kindred character by-and-bye:—six persons were killed on the Edinburgh and Glasgow Railway, in consequence of some delay in running trains down the declined tunnel into Glasgow; the second part of the Perth train ran into the first. I am told that the second train ran in only at the rate of 3 or 4 miles per hour, but could not be entirely stopped in time. A train going at the rate of 30 miles per hour cannot be stopped by the ordinary appliances under 400 yards. In this case the train had not been running at 20 miles per hour, and although slowed considerably, was still moving from 3 to 4 miles when the engine struck the preceding carriage. I believe the signal men are to blame.

Considerable hopes are entertained here of the finest quality of cotton being cultivated in Ceylon. It is found to grow better there than in any other part of the East. The price of cotton in the Deccan is not over 1d., and 1⅜d. the lb. At Port Natal, the few bales hitherto prepared, have not brought over 2d. on the spot; the quality was good, and sold in England for 6d., 7d. and 8d. A company is going to advance money for the purchase of cotton on all the west coast of Africa, where it is indigenous and grows wild. Some speculations exist respecting the probability of growing it in Asia Minor and you will soon hear of cotton plantations on the Euphrates and Tigris.

The imports to London, from India, during a period from January to 1st September last, for the past and present year, have been 69,680 bales in 1849, in 1850 172,200 bales—increase 102,520 bales. But the greatest rise was in the four last months, and I should not be surprised to find, before the first of January 1851, an advance of 150,000 to 200,000 bales on the quantity received in 1849—a matter of small importance at first sight, but one which makes a great difference as to price.

The Egyptian yield of corn and cotton is remarkably good for the season. The difference with the Brazils may affect importations from thence of coffee and cotton. Your journals speak of the proceedings in Brazil; do they know that we paid £400,000 (nearly $2,000,000) for the treaty? We merely require it to be observed as a measure of common humanity. This money should be returned if she is dissatisfied with her bargain. Great progress has been made in the excavations of Nineveh. The records of the Assyrian empire have been found in a huge chamber, engraven on plates, which have been apparently hardened after the characters were written:—the writing is in a cuneform character. The discovery is of immense interest, and when Layard and Richardson have done with their decyphering, you will have, I am told, a cheap edition of the Assyrian Records, as complete, at last, as those of Athens and Sparta.

At present the Court and Cabinet are in Scotland—the Queen at "Loch na Gar"—the Premier at Dunkeld—the Chancellor of the Exchequer in Lochabar; we have, therefore, no political news. Poor Louis Philippe has found a temporary grave in England. General Haynau was nearly demolished by Barclay & Perkins' brewers, on last Thursday—he should not have come to a free country where his acts are known, as in England. X. X.

Tea Cultivation.

The tea cultivation in South Carolina is still successful in its results. Dr. Junius Smith says that the tea nuts received by him from China in May were planted in June, and that on the 5th of the present month of September many of them were from one to three inches in height—"strong, healthy, beautiful plants from the original China seed, germinating so as to lift themselves above ground in less than three months from the time of planting the nuts."

Washington Irving's British Copyright.

By foreign papers, it is believed that Washington Irving will be able to keep his copyright in England, for though born in New York, his parents were born in Scotland, and this makes him, according to law, a Briton, entitled to take out a copyright.

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New Inventions.

Improvement in the Purifying of Gas.

We learn by our excellent exchange "The London Patent Journal," that a Mr. W. Cormack, of Haggerstone, near London, has secured a patent in England for a new improvement in purifying gas, which is well worthy of being known in America. He takes 140 lbs. of copperas and 74 of common salt, and dissolves them in 150 gallons of water. This is placed in the purifyer—a vessel for that purpose. The gas passes through this sulphomuriate of iron solution, and in doing so, it is freed from all ammonia and sulphur. The sulphur and ammonia are absorbed by the solution through which it passes. When the purifying liquor is exhausted, it must be changed. A chemist will be able to tell when this should be done by the common tests of sugar of lead and turmeric paper. The exhausted purifying liquor contains salamoniac and sulphate of soda in solution, and sulphuret of iron. Another way to use these materials, is what is termed "dry purifying." For this purpose the same quantity of copperas and salt are mixed with two bushels and a half of broken charcoal—all moistened with water, to a soft consistence. The gas is passed through this in the same way as by what is termed the "dry purifying" already mentioned.

The salt is what is new in this invention, as combined with the copperas, but the latter has long been used as a purifyer. To remove all the carbonic acid gas, lime water must be used, so the above must only be employed for the removal of ammonia and sulphur. We state this plainly, to let those of our readers know what is new, and what it can, and cannot do.

We believe the composition to be a good one, and we see wherein its application may be improved. For example :—let the solution be kept in a "purifyer" containing wool or hair, and let there be a connection with a reservoir above, centaining the pure dissolved composition, so that a dropping supply may be kept up from above, and the sediments be allowed to percolate through a false bottom into a receiver; this would make a constant purifyer. The gas should pass from this first purifyer into a lime purifyer, and in this way, gas of the utmost purity would be obtained—something we do not always get in New York.

Improvement in the Manufacture of Flour.

The Rochester Democrat says, a gentleman named Bonnell has recently brought out an invention by which a barrel of superfine flour may be produced from three and a half or four bushels of wheat. Mr. Spaulding, of Lockport, states that by the use of this new process he has recently obtained a barrel of superfine flour from four bushels of pure Ohio wheat, weighing sixty pounds to the bushel. The Detroit Advertiser states that it is an established fact that there is a barrel of excellent superfine flour in two hundred and ten pounds of good dry wheat, weighing sixty pounds to the bushel—*i. e.* three and a half bushels.

Appropriation for Electro Magnetism

Senator Benton moved on the 23rd inst. that $40,000 be appropriated to enable Prof. Page to continue his experiments on electro magnetism. Mr. Benton addressed the Senate on the advantages likely to result from the perfection and completion of the experiments.

Messrs. Cass, Jefferson Davis and Foote, opposed the appropriation.

Mr. Dickinson said he had just received a letter from a constituent who was making experiments on the steam engine, and as Prof. Page had received an appropriation of $20,000, he thought that an equally important sum should be appropriated to enable him to carry out his experiments. The motion of Senator Benton was rejected. The whole appropriation would have amounted to $60,000—a very large sum, indeed, for experiments.

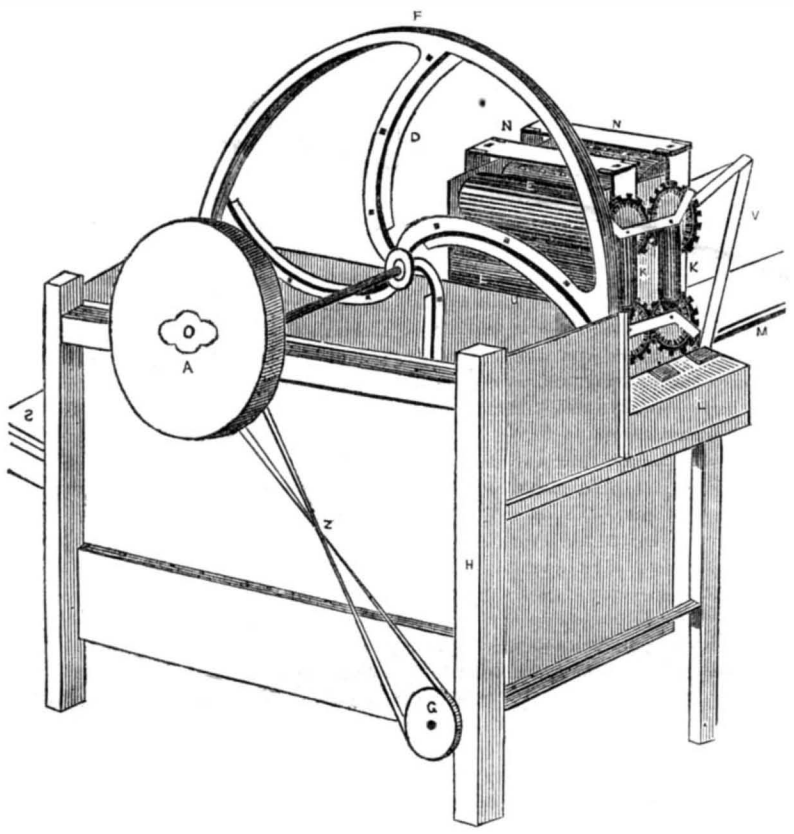
New and Improved Kind of Soap.

Messrs Cadwell, Payson & Co., 289 Rivington street, this city, have lately made an improved Soap, which we have examined and tried, and have found it to be of a very superior quality. It is well known that the basis of all soap is alkali and oil or grease, but there is so much difference in the qualities of different kinds of soap, that there can be no question of great skill and secrecy in the manufacture of some particular good kinds, and respecting this new kind of soap, we have found it to be practically a most excelling kind, for the removal of dirt and grease, and at the same time eminently easy on the colors—that is, in washing calicoes, &c.

Invention for the Opening of Iron Shutters of Stores.

Mr. Asa Willis, a member of the New York Fire Department, has invented an excellent apparatus for rapidly opening the large iron shutters of stores, so as to open them rapidly during a conflagration, as heavy losses have many times occurred from the impossibility of opening the upper shutters quick enough from the outside. One of these apparatus is now in operation at Messrs. Pentz, 55 Water street, where the iron shutters of the store, in every story, can all be opened by a chain from below.

BURREL'S PATENT CANE CUTTER.



This is an improved machine, invented and patented by Thomas & Edward Burrel, of Seneca, N. Y., and which was patented on the 11th day of September, 1849. It was awarded a premium at the late State Fair, at Albany.

This figure is a perspective view of the machine; it has a frame made in any common way; in front, however, the cutter wheel, F, revolves in a box, and the cut cane, stalks, or whatever it may be, falls down on an endless apron, and is carried up and deposited in any convenient place, as shown in the direction of the said apron, S. The cutter wheel, F, has curved knives, D, secured on it in the usual way. A is the main pulley, to receive motion by a belt from any known power; Z is a band to drive the small pulley, G, which operates the endless apron, S, and carries up the cut stuff as mentioned. V is the feeding box, a part of which, only, is seen; and M is another endless apron, which carries the stuff into the feed rolls; H is one of the posts of the frame; E E are the front feed rollers,—there are four of such rollers, one pair placed behind the other; L is a back bed piece; and there are metal plates on each side of the feed box, for the bearings of the feeding apparatus. On the front end of the feed box is a metal die, U, for the knives to cut close up to the box. N N are the slide bearing plates of the rollers. The object of the rollers is to produce a feed to the cutter wheel, which will be always steady, and hold the feed firmly to the action of the cutters, however fast the speed of the cutter wheel may be. All the feeding motion is derived from the main shaft of the pulley, A. This shaft has a worm wheel on its inner extremity, which meshes into a bevel gear on the opposite side, which gears into the two fluted vertical roller wheels, K K, and these move the upper feed rolls. The roller wheels, K K, allow the upper feed rolls to move up and down in slots, for inequalities of the feed, and still all the feed motion be in gear. The top hind roller has spikes on its periphery to gather in the cane, straw, or stalks, and the combination of the whole of them, holds the feed steady to the action of the cutter wheel, and at the same time there is a free movement for inequalities of feed.

The claim is, first, the employment of four feeding rollers, in the manner herein described, the top hind roller having spikes on its surface, to hold firmly the straws, &c., and the combination of the said four rollers to feed in the stalks or straw with a steady uniform motion, so that the action of the cutter wheel will not arrest the motion of the sheet of stalks, &c., when fed into the knives, however great the speed of the cutter wheel may be.

Second, The cylinder fluted pinion wheels, K K, in combination with the upper cog wheels, to allow the top rollers to rise up and slide down, when different thicknesses of stalks, &c., are fed into the cutters—this being a superior manner of gearing to accomplish this object and avoid all breakage of cogs in the wheels.

More information may be obtained by letters addressed to Messrs. Burrel, at Seneca.

Philadelphia Art-Union Plate.

We have just seen the engraving by Mr. Ritchie, Chambers street, this city, for the Philadelphia Art Union. The subject is "Mercy's Dream," from a painting by Huntingdon. This is one of the finest engravings that we ever saw; it places Mr. Ritchie if not the very head, at least at the very head of engravers in America. We venture to say that it is the best work of art ever produced in our country, and the subscribers to the Philadelphia Art-Union will possess a plates as superior to any ever awarded by the New York Art-Union, as any one can well imagine.

Ocean Steamers.

The Cunard Line of Steamships are to run hereafter, between New York and Liverpool, without touching at Halifax; we will, therefore, have four lines of steamships running from New York, direct to Europe, viz., the Cunard, the Collins, the Havre and the Glasgow lines. New York, seemingly, is the grand centre of American navigation.

Interesting to Inventors.

Within the past few months we have been engaged in re-fitting and extending our apartments, to better facilitate the transaction of our increasing business. We are now happy to inform our inventing friends that the rooms which we have been fitting up, expressly for the transaction of Patent Office business, are completed; and with an increased force of Examiners, we are now able to transact every kind of Patent Office business with greater dispatch than we have ever previously been able to do. The number of Examiners, Draughtsmen, and Specification Writers that are constantly employed in this office, render our facilities for making applications for Foreign and American patents superior to that of any other Agency in the United States.

From July, 1849, to July, 1850, (one year) over 300 applications were made for letters patent, through this Office, but a small number of which (considering the vast number of applicants) were rejected.

Our American and efficient board of Foreign Examiners, Draughtsmen and Specification Writers, consist of nine persons, each of whom has his particular branch of business assigned to him, so that no confusion or derangement ever occurs in transacting our vast business.

In addition to the already enumerated advantages an inventor derives from having his Patent business done at this Office, he is enabled to save at least one-third of the expense of making his application. The amount of business we have to do, and the facilities we possess for doing it, renders us able to make applications for at least one-third less price than those who do business on a small scale, as well as to be more familiar with patents already granted or those pending at the Patent Office.

The persons whom we employ to examine inventions, for the purpose of determining the patentability of them, are experienced in the business, and as familiar with the models which are on exhibition at the Patent Office as the Patent Office Examiners themselves.

A valuable library of Scientific and Mechanical books and publications are always at the service of those gentlemen employed in this Office, which render great aid in determining the patentability of inventions that are submitted for their examination.

We also possess a list of every patent that has been granted since the establishment of the American Patent Office, with the names of the inventors, and the claims of all the patentees for the past fourteen years.

Taking every thing into account, the best Patent Agency in the United States, for transacting home or foreign business, is at the Scientific American Office, 128 Fulton street, New York.

For reference, apply to the hundreds who have secured patents through this Office. See advertisement.

No. 1 Vol. 5, Sci. Am.

If any of our friends have duplicates of No. 1 Vol. 5, Scientific American, they will confer a favor on us by sending them to this office, as we wish to accommodate many who have failed to receive them. When put into a wrapper directed to the "Scientific American" they will be allowed to pass through the office without the necessity of pre-paying the postage.

Propellers.

Philadelphia seems to be going ahead in the construction of steam propellers (Loper's) :—two large ships, the "Union" and "Commodore Stockton," were lately launched at Kensington, for the California trade. On their trial trips, both of these propellers made excellent time.

Subscribers wishing to have their volumes of the Scientific American bound had better send them to this office as soon as possible. They will be bound in a substantial manner for 75 cents.

Erratum.

The description of Mr. Macomber's Straw Cutter, No. 50, Vol. 5, stated his residence to be at Burlington Vt., it should have been Bennington.

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Scientific American

NEW YORK, SEPTEMBER 28, 1850.

Genius is Democratic.

It is related that on the evening before the battle on the Plains of Abraham, Gray's "Elegy on a Country Church Yard" was read in a circle of officers, among whom was Wolf, the commander-in-chief. So fascinated was he with that incomparable poem, that he exclaimed, "I would rather be the author of that poem than the conqueror of Quebec." Wolf was right in his estimate of imperishable fame. The conquest of Quebec and the name of Wolf, appear as specks upon the page of history,—but while the sun shines on the hills of England, the prairies of America, and the mountains of Gilboa, the name of Gray will be revered, and his "Elegy" will continue to influence and inspire thousands of hearts in every part of the world. If Wolf had survived, he would no doubt have been made a Peer, as warriors and statesmen seem to be the only kind of men worthy of such honors in England; but what is it to bequeath the family title of Duke or Lord, in comparison with living "with the living for ever," like Gray. Long rows of ducal coronots on gilded escutcheons, nod gloomily in a hundred noble vaults of old England, but what are the titles of the dead to the living?

By late accounts from Europe, it is stated that Robert Stephenson was offered knighthood, and refused it. The reasons for such a refusal he knows best himself, but the title of Baronet could not elevate him, as a man, one step above his present position—it would not confer on him a single honor. Nevertheless, we cannot but say that we like Queen Victoria for the offer. As this is the way aristocratical governments honor their citizens, we feel some pleasure in knowing that engineering attainments are highly estimated by the present British Ministry.

We have also been informed that M. Farrady had been offered knighthood, and refused it from religious motives. That great and good man has no earthly ambition but to do good, and labor for immortality. This reminds us of the offers of knighthood made to Benjamin West, and refused; to James Watt, and refused, and the Peerage to Robert Peel, and refused. Titles could not add honor to the fame of any of these men.

Our object, in this article, is principally to notice the simple dignity, and what we would call "noble humility" of those great men who refused the titles offered them by the admiring sovereigns of their country. It is well known how these honors are coveted by thousands, —some would give their weight in gold to wear such honors, but those men whose names we have mentioned, were made of other stuff.

It would be well if some of our own people —those who are so fond of the titles Honorable, Squire, Colonel, Captain, &c.—would learn a lesson from the conduct of those great men.

Our own Ben West, the great painter, was modest; James Watt, the inventor of the steam engine, was meek and retiring; Farrady, the profound chemist, is humble, and Stephenson, the great engineer, appears to have no desire for honors conferred by one who "can make a belted knight, a lord, and duke, and a' that," but who cannotmake an honest, honorable, nor talented man. Genius is truly Democratic—the names of those great men may go down to posterity untitled, but not unhonored nor unsung—for they were and are noblemen of the human race.

Our Foreign Correspondence.

We call particular attention to our correspondence of this week. Every thing said in it may be relied on, and we can say this much for it,—it is from a source which the proudest paper in the United States might envy. We hope our people will take a lesson from the manner in which justice is administered in Scotland in respect to steamboat accidents. Allison says that justice is perhaps better administered in that country than in any other. Our Southern readers will find something interesting about cotton, and every body will be interested with the valuable discoveries mentioned as having taken place in Nineveh.

Machine for the Artificial Production of Ice.

Our constant readers may remember a communication published in Volume 4, respecting an invention of Dr. Gorrie, for the artificial production of ice. The communication was from New Orleans, and it was answered in a cotemporary paper, seemingly, from the same place, but it was unworthy of a notice from us. Since that time Dr. Gorrie, who is residing at Apalachicola, has matured his invention, after many experiments and many failures, and has succeeded beyond expectation in producing a machine which, by condensation and expansion of air, produces ice artificially in quantity according to the size of the machine, and that is, in great abundance, at no great expense. He employs two force pumps, which are the principal parts of the machine. Into the pump for condensation of air, a smaller pump injects water in a fine shower, while the air is condensing, which thus absorbs the heat of the air that is given out in the act of compression. Between the condensing and expanding pumps there is an air reservoir, which is of considerable size, and made like a steam boiler. This vessel is intended to receive the condensed air and retard its passage, so as to afford time for its effective cooling, and to act as a magazine of force for working the expanding engine. The expanding force pump is the principal and most interesting feature of the whole, because it is the agent in which the expansion of the air and the production of cold first takes place. All the other parts must be nicely adjusted in propertion to this part, for the making of the ice economically. The absorption of the heat is accelerated by immersing this vessel in water, and causing a jet of liquid to be thrown into its interior, as into the condensing pump.

This liquid is not congealable, and is withdrawn from a larger, though properly proportioned quantity, contained in an insulated cistern, into which, after performing its office of imparting heat to, or in other words, absorbing cold from the expanding air, it is returned through the eduction valves of the engine. As the liquid of this cistern has its heat diminished at every stroke of the engine, by the abstraction of the jet at one temperature, and its return at a lower, it is practically a reservoir of cold—an accumulator of the refrigerative action of every cylinder full of expanding air. It is thus fitted to be the laboratory in which ice may be manufactured, and which it produces by abstracting the caloric of fluidity from water, immersed in it in suitable vessels.

Cold of an intensity of even hundreds of degrees below the atmosphere may be obtained by this process, but experiment shows that the temperature of the cistern most favorable for the rapid production of ice, is at about 10° F. The expanded air partakes of the same temperature as the cistern, and, therefore, at 10° F., leaves it charged with a high degree of cold, which the economy of the scheme requires should not be wasted. Instead, therefore, of being allowed to escape into the atmosphere it is directed through an apparatus—made like a brewer's refrigeratory for cooling worts—around which is placed the water it is intended to prepare for congealing.

It has been ascertained that pumps of a cubic foot capacity worked at a temperature of 90 deg. Fahrenheit, and fifteen revolutions a minute, are adequate to make a ton of ice per day.

Dr. Gorrie is not the least estentatious about his discovery, and what speaks volumes for his generosity, like Dr. Arnot, he considers his invention a benefit to the human race, especially in warm climates, hence he gives it freely to the public, and seeks no exclusive privilege from government.

To our Cotemporaries.

We are much obliged to you for the very favorable notices you have given of our new Volume. We are certainly much indebted to you for the good will you have always exhibited towards the Scientific American. Our friends are always increasing—we never had so many favorable notices before, nor so many of such a flattering nature. We are proud to know that the Scientific American is universally regarded with no little pride among our friends of the press. We will try and make it always worthy of their esteem.

A Question for the Curious.---Molten Metals.

Why will all the metals, and most other fusible solids, when in a fusible state, buoy up the same metal in a solid state?

1st. That this is the case is beyond the possibility of a doubt, as any one can easily satisfy himself by experimenting.

2nd. That iron, brass, lead, zinc, tallow, &c., &c., occupies less space when cool than when melted, I consider as certain from their shrinking when cooling.

Now, if it occupies less space when solid it must be heavier than when melted, and so the heavier swims on the lighter. A reason for this is requested. E.

[We publish the above to make a few comments thereon, as we receive a great number of communications of a similar character, which we do not answer, because a critical examination of standard philosophical works would lead the authors to the same conclusions with ourselves.

Our correspondent has overlooked the most singular phenomenon in both of his questions, without even thinking it was anything but what he could give a good reason for; that is, the rendering of metals fluid by heat:—can he explain that? All we know about nature's laws, is only secondary knowledge,—we cannot, and never will be able to judge of prime first causes, because we cannot reach beyond the laws of *our* own creation, which are cognate to those of all created objects. Every mechanic who has had cause to melt metals, knows the facts stated above, but for all this, those who do not know about such things, must suppose that the solid cold metal will keep floating on the molten and remain solid. No. When cold metal is put into molten metal, it floats for a time, but it soon mingles with the fluid, and can, by stirring, at once be made to sink. The cause of the metal floating is, no doubt, owing to electrical repulsion. A needle will float on water from the same cause. Every body knows this, but this is certainly no more curious than the fact of a piece of steel—a magnet—supporting, by the law of electrical attraction, a piece of iron many times its own size—(a piece of loadstone 14½ ounces having carried 16 times its weight.) Now, if the question is put to the most astute philosopher in the world, "why is the magnet thus enabled to lift a weight so many times greater than itself?" he could not answer. Scientific men know that certain things produce certain effects, and by induction they establish a theory, or in other words arrange the facts. This is science. The man who knows the greatest number of facts, is the most scientific man.

We are but partially acquainted with the relations of heat. Caloric is a chain, the middle links of which are all that philosophers see. Heat has the effect of expanding almost every thing, but not all, for it contracts alumina. It is generally supposed that heat hardens clay, and so it does; but apply a more intense heat to clay than is applied to burn bricks, and what have we? A fluid. Clay can be made fluid in a crucible, and a very hard substance when cool, is the result.

We have answered our correspondent, as well as any other scientific man could, and have endeavored to throw out some useful hints to others.

The Sea Serpent.

The sea serpent has been seen and shot at in the Cove of Cork, Ireland. Some of the scales of the sea serpent have been found, which his serpentship rubbed off on the supports of the "Beacon." A rifle ball was fired at him by a Mr. Travers, and it is supposed that he was wounded. He leaped thirty fathoms (150 feet) out of the water—so says Mr. Travers in a letter to the Cork Constitution. He must be a flying as well as a sea serpent, at this rate. Well done, ould Ireland.

War about the Materials of the Washington Monument.

At the late Meeting of the American Scientific Association, it is reported, that Prof. W. R. Johnson said, that the stone of which the Washington Monument, at Washington, is built was of poor quality, and would not last. Mr. Whittlesey, the President, we believe, of the Association, has written the following letter to the Assistant Marshal of Connecticut, denying the statement in terms a good deal more emphatic than courteous:

Dear Sir:—Your favor of the 3rd was received this morning with a slip of newspaper containing the false and infamous statement of Professor Johnson. It is totally unfounded in every respect, as you may perceive by the accompanying reports and article, of which another will appear to-morrow, which I shall send you. Every test and examination gives additional evidence of the superiority of this monument for the purpose of an enduring monument. It is a proper material in every way to build the whole structure of, in place of being used for facing of the main edifice, fourteen feet of the thickness of which is built of gneiss rock, the firmest in the world.

I am sorry that a man who styles himself Professor should so recklessly expose his ignorance. Most sincerely yours,

Elisha Whittlesey.

In addition to this, Robert Mills the architect, and Prof. Page, of the Patent Office, sent a letter a short time since to the Philadelphia Ledger stating that they had tested by a powerful hydrostatic press, the relative power of this stone, in comparison with others, to sustain a crushing force. The letter says the marble was selected by the Board of Managers with great care, after experiments and consultations with competent scientific gentlemen, and when a few courses were laid, Professor Johnson addressed a communication to the Board expressing this opinion, that the material was not durable, and he asserted he could crush it in his fingers like loaf sugar. The Board immediately took measures to test the material, and the result was that the average of eight different blocks tested showed that the crushing force of the marble exceeds ten thousand pounds, equal in strength to the granites, and capable of sustaining a weight four times as great as the Monument. The atmospheric action on the same description of marble was ascertained by Dr. Page to be the fifteenth part of one grain, (the specimens were cut into inch cubes, and the time of action four weeks,) compared with the large crystal marble of New York, (like that used in the facing of the General Post-office,) it was found to be but a moiety, while the Patent Office light sandstone lost 18 60-100 grains.

Perhaps Prof. Johnson may be able to prove his side of the question perfectly clear, the way Dr. Thompson once floored Dr. Ure.

Prizes by the American Institute.

The Institute this year will award a gold medal for the best plan for ventilating steam and sailing vessels; also, one for the best plan of ventilating public and private buildings. Five hundred dollars are also appropriated for premiums to apprentices—a very commendable practice, indeed. The Fair will be open three weeks. Those who desire to have engravings made of their machines for the Fair, can have them done at this office, in a far superior style than they can elsewhere.—Those desiring their inventions examined and noticed, should drop us a few lines, or call at the office.

An Improved Water Wheel.

We have received information from a trusty correspondent about a new Water Wheel, invented by Mr. Daniel Ehle, of Fort Plain, N. Y., who has applied for a patent. It is superseding the wheels in use around that place, and our informant, who is well acquainted with different kinds of wheels, states that it is better than any with which he is acquainted, and is superior to Rich's, which he considers an excellent one. We have a hope that we may be able to present this wheel to our readers, well illustrated, at some future day. Every improvement in prime motors is of great benefit to the world.

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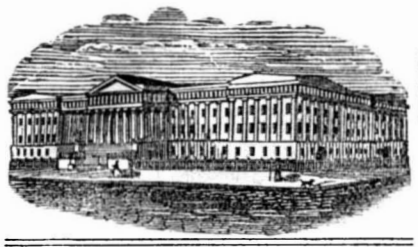

☞ Reported expressly for the Scientific American, from the Patent Office Records.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING SEPTEMBER 17, 1850.

To S. T. Armstrong & C. J. Gilbert, of New York, N. Y., for improvement in the process of working Gutta Percha.

What we claim, under the first part of our invention, consists in the use of lime or other alkaline substance, with heat, in the manner substantially as herein described, in the cleaning of gutta percha, to neutralize the acid or acids contained in that substance in its crude or native state, and thus preserve and render more permanent its useful properties, as specified.

And in the second part of our invention we claim compounding lime with gutta percha, substantially as herein described, for the purpose of improving its qualities, preserving it wholly or partly from deterioration, and protecting it against the injurious effects of the atmosphere and heat, substantially as described.

To C. D. Birdseye, of New York, N. Y., for improvement in the process of preparing cream.

I claim the process described herein of distilling milk and condensing the same in sugar, for the purpose of preserving the flavor, as set forth.

To Wm. Blake, of Boston, Mass., for improvements in Spike Machines.

I claim the heading and carrying nippers in combination with the shears, the header and the griping mechanism, the same being made to operate in connection therewith, substantially as above specified.

And in combination with the lower nipper I claim the spring catches, latching and unlatching apparatus, applied to it for the purpose above specified.

To F. A. Calvert, of Lowell, Mass., for improvement in machinery for Ginning or Picking Cotton.

I claim the combination of such parts as I have shown, forming a picking machine and their mode of action, as hereinbefore described.

To J. W. Carpenter, of Pontiac, Mich., for improvement in processes for preparing wheat for grinding.

I claim the application of an acidulous composition to wheat or other grain, the said composition being principally vinegar, but I do not limit my claim to the exact composition of acids, as herein described, while the same effects can be produced by the vinegar alone, or when combined with one or more of the other acids, especially with the sulphuric acid, for the purposes set forth.

[This, we have heard, is a most valuable discovery.]

To W. A. Collord, of Cincinnati, Ohio, for improvement in Paper Filers.

I claim, first, the arrangement and construction after the manner substantially as described, of a box or receptacle for documents and papers, having a lid fitting loosely within it, which is made to press down upon the papers by a spiral or other suitable spring.

Second, The rod, or its equivalent, attached to the lid, and moving in the guide slits or apertures in the sides of the box, the said slits terminating in a notch or shoulder at their upper extremities, for the reception and retention of the rod during the manipulation and examination of the file.

To Ebenezer Danford, Jr., of Geneva, Ill., for improvement in Grain Harvesters.

I claim the application to a reaping and mowing machine, of two sickles, working together in opposite directions, as set forth in the above specification and accompanying drawings, so as to throw the weight of the moving parts upon opposite sides of the centre of the crank or bit, for the purpose set forth.

To H. H. Day, of Jersey City, N. J., & R. McMullin, of Great Barrington, Mass., for improvement in India Rubber Hose.

We claim the making of flexible hose or pipe, by combining india rubber leather with a tube or rubber, substantially as herein described, the whole being united, forming one solid tube, making a strong, durable, and flexible hose, adapted as a substitute for leather and other similar pipes for the conveying of fluids.

To Gerrett Erkson, of Hobart, N. Y., for improvement in the Plow Clevis.

I claim so making a clevis with teeth or prominences, and cavities on the front surface of a socket matching with corresponding depressions or cavities and elevations on the surface of a movable bar, that the bar and socket when set together by a screw or other equivalent fastening in the required position, may have numerous bearings and be wholly prevented from either sliding or revolving in any direction without breaking the continuity of materials of which the parts are composed.

I also claim, in combination with a series of radial ridges, or a circle of cavities on the end of a clevis socket fixed at the extremity of the plow beam, a series of teeth or of conical points on a movable clevis bar, so adjusted to each other, that the guide hole of the clevis-bar may be held in any required position, and at any necessary distance from the axis of the beam, without relying on friction of the surfaces to prevent slipping, in the manner and for the purposes herein set forth.

To John B. Fairbank, of Leon, N. Y., for improvement in Printing Machines.

I claim the mode of representing letters and the sounds of letters, by means of characters made by changes wrought upon a less number of movable type than the number of letters or sounds of letters represented. The type being made upon, or attached to, the bottom of wires or rods, which are worked by keys at or near the top, substantially as herein set forth.

To S. L. Graves, of Springfield, Ill., for improvement in Corn Shellers.

I claim the device herein described, for twisting and forcing the ears of corn between spring shelling plates, substantially as herein set forth.

To Sylvester Groesbeeck, of New York, N. Y., for improved tool for forming plaster cornices and mouldings.

I claim arranging a former, for making mouldings upon the walls and ceilings of a room, upon the diagonal of a square frame, and making an angle of forty-five degrees with each side of said square, for the purpose and in the manner described.

To George Mallory, of New York, N. Y., for improvement in Daguerreotype Plate Holders.

I claim the daguerreotype plate holder, constructed substantially as herein described, of a block with a spring edge, by which the plate is secured to it.

To Wm. Morrison, of Carlisle, Pa., for improvement in Spring-beams to Plows.

I claim, first, the adjustable spring-bar interposed between the point of draft and the frame of the plow, in the manner and for the purpose herein set forth.

To J. L Mott, of Mott Haven, N. Y., for improved roadway for rail cars and ordinary vehicles.

I claim the method, substantially as herein described, of making rails for the road ways of streets, &c., by combining with the rails on which flanched car wheels run, outer faces of sufficient breadth for the wheels of common carriages to run, made curved or inclined from the top of the rail, substantially as described.

And in combination therewith, I also claim making wide faces on the inside of the rails, substantially as described, for the wheels of common carriages to run on, as described.

To Benjamin Severson, of Schenectady, N. Y., for improvement in cast iron Railroad Car Wheels.

What I claim is a cast iron wheel in one piece, having the rim connected to the hub by two plates joined together at intervals, at points as small as may be, and nearly equidistant from the rim and hub, said plates being of such form that each section by the plane of the axes, passing through the points of union, shall present two pointed arches, uniting at the apex, the one springing from the ends of the solid hub, and the other from the edges of the rim—and a similar section between the points of union, shall bestow flat curved lines bending towards each other, and joining the ends of the solid hub with the edges of the rim; and a circular section passing through the points of union of the two plates, shall produce a double series of flat arches, united to each other at their ends. The whole being constructed substantially in the manner and for the objects herein set forth.

RE-ISSUES.

To Anson Atwood, of Troy, N. Y., for improvement in Stoves: first patent dated May 14, 1850.

I claim the air chamber, in which the air is heated previously to its admission to the fuel, in combination with the apertures by which the heated air is caused to impinge on the upper surface of the fuel, substantially in the manner and for the purposes as described.

To Isaac Gregg, of Philadelphia, Pa., for improvement in Brick Presses: first patent dated June 6, 1848.

I claim the making the moulds of extra depth, in combination with the elevation of the bricks in the moulds, after they have been pressed a distance equal to the extra depth given to the same, and the removal of the surplus thickness of the bricks, raised above the tops of the moulds, by a knife, or its equivalent, for the purpose of giving uniform solidity and perfection of form to the bricks, prior to their final removal from the moulds, substantially as herein set forth.

To Stephen P. Ruggles, of Boston, Mass., for improvement in Printing Presses, first patent dated Nov. 10, 1840.

I claim a platen raised and lowered by machinery substantially as above described, in combination with the movable tympan plate on which the sheet of paper is placed, and the bed supporting the type with their faces downwards, the whole being arranged, and operating together, substantially in the manner and for the purpose herein explained and set forth.

I claim supplying the press with paper, and removing the same after it is printed, into a box attached to the tympan carriage, by means of a vibrating table, operated by a cam on the shaft, in combination with a frisket, as above described, connected to the frame of the tympan plate, and pressed down upon said plate by a spring, and raised when the tympan carriage recedes with the printed sheet by means of a cam on the shaft, through the intervention of a bar with a roller, shaft, and angular piece of metal, the whole being arranged and operating together, substantially as hereinabove explained and set forth.

I claim grooving or channeling the fountain roller or plate under the same, in the manner and for the purpose above mentioned.

I claim the peculiar combination of machinery for the lateral vibration of the distributing roller; said combination consisting of the pulleys on the shaft, B, band, pulleys, rods (two lever, shaft and distributing roller frame, the whole being arranged and operating together, substantially in the manner and for the purpose above mentioned.

I claim the use of the side and cross strips, or either of them, in combination with a tympan supported by the platen plate, the said combination forming a pair of nippers, as it were, for rigidly holding the sheet, however small the margin may be, until it is effectually free, or disengaged from the form, after an impression is produced.

DESIGN.

To John C. King, of Boston, Mass., for design for bust of Daniel Webster.

What I claim as my invention, or production, is the design of a bust of Daniel Webster, as represented in the annexed drawing.

[As we have had many enquiries about whether a drawing was necessary or not, for busts, and alto-relievos, the above claim will give the necessary information to two or three late correspondents. Every thing but chemical discoveries require drawings.

Iron Direct from the Ore.

We see by some of our exchanges, that Mr. James Renton, of Newark, N. J., has erected, along with some associates, a furnace at Charlottenburg to make iron, by his new process, direct from the ore. If this can be done, then we can beat foreign manufactures with, or without a tariff.

For the Scientific American.

The Sinking of Ice.

The sudden disappearing of the ice in some of our northern lakes, at the approach of spring, has given rise to the notion that it sinks to the bottom. The well-known fact that the specific gravity of ice is less than that of water, nearly as 93 to 100, excludes the possibility of its sinking, as supposed.

As I observed that this theory of sinking was vindicated by a learned professor at the late meeting of the "American Association," I wished to show, in a few words, that this apparently singular phenomenon depends entirely on the specific gravity of ice being less than that of water. In consequence of this, ice must, in all cases, rise to the surface when left to float freely in water, however minutely it may be divided, as long as a crystal remains. The temperature of the deep water of those lakes, always more or less, counteracts the effects of the cold atmosphere of the winter around them. As the cold increases it first overcomes the temperature of the water in shallow places and along the shores, so as to form ice. This continues to extend and increase as long as the temperature of the atmosphere is so low as to absorb the caloric faster than it is supplied from below.

On the approach of a thaw the temperature of the atmosphere rises, and it ceases to absorb the caloric from the surface as before, while the heat from below reverses the process, and a thaw is commenced. The ice diminishes slowly at first, but as its quantity diminishes, the supply of caloric increases, and the melting will progress at a rapidly increasing ratio. During all the time of this process, all the ice that remains will constantly present itself at the surface, showing an immense sheet, while its depth is reduced to a mere pellicle, and the next hour it is completely dissolved. SILAS CORNELL.

Friends' Y. M. B. School, Providence, 9th M., 9th, 1850.

[There are some things about the sinking of ice, which our worthy correspondent has overlooked, viz., the suddenness with which very thick cakes of ice disappear. The sudden disappearance of ice is common on all the northern lakes—Champlain, St. George, Oneida, Ontario, and the River St. Lawrence. Prof. Olmstead was in error respecting the phenomenon being peculiar to Lake Champlain,—and we know, practically, that it is not reduced to a thin pellicle before it so suddenly disappears. There is what is called anchor-ice—ice seen lying at the bottom of rivers and ponds; we know considerable about such things. The anchor ice, as it is called at the North, will make a good subject for another paper to the next Convention, and it would be a benefit to science if some of our deep-thinking men would study, personally, the phenomenon next spring.

Steam between Philadelphia and Liverpool.

The project of establishing a monthly steam packet line between Philadelphia and Liverpool is likely to be realized, through the enterprise and liberality of Richardson, Watson & Co. They have headed a list of subscriptions to this undertaking with the sum of $100,000—one-third of the amount required to build two propeller steamships of 2,000 tons burthen, to run, once a month, to and from the places named, the passage to be made in 14 days; the number of steamers to be increased to four, if found necessary. The merchants of that city have long been talking of such a project, but this seems to be the first efficient step towards the enterprise. Its success will induce others to follow, and Philadelphia, through the agency of steam, may be again distinguished for her commercial prosperity.

Assuredly no city in the Union presents a better field for constructing steamships than Philadelphia, and it is not too much to say, that her anthracite coal will yet be used in preference to the bituminous, on sea as well as river steamships.

The Quickest Passage.

The Steamship Pacific arrived at this port on Saturday, the 21st inst., in 10 days and 4½ hours. This is the fastest passage ever made between New York and Liverpool.

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TO CORRESPONDENTS.

"J. R., of Mich."—You cannot obtain a good work upon Milling that we know of. The demand for such a work is very limited, and could not pay for publication at present.

"J. P. B., of N. Y."—We have entered your name as a subscriber up to No. 31 Vol. 6., we cannot pay postage on papers in advance.

"E. J. T., of N. Y."—The notice you refer to was copied from the St. Louis Republican, as you will see, and we particularly noticed that the name of the inventor was Jackson, but the place of his residence was not given.

"B. H. B., of Pa."—You will please communicate more fully with us in regard to the subject, or we cannot attend to your enquiries.

"N. W., of N. Y."—We can see no reason why you should not make a claim to the arrangements of the two series of planers. If however the principle is the same as that used for other purposes, no patent could be obtained for this particular application. You had better construct a small model and send it to this office.

"G. F. L., of Ind."—We have no prospectus for either of the publications you refer to. They can be sent by mail; prices $3 and $10.

"G. R. B., of Ala."—The timber requires to be sawed into suitable lengths—quartered and steamed before cutting. The latter, although not absolutely necessary, is best, as it makes the article more tenacious when dry.

"D. E. S., of Ohio."—The eccentric bedstead fastener is not new, they have been in use for a long time. We can see nothing patentable in the arrangement shown in your model.

"H. E. A., of N. Y."—No patent could be granted for your pulley; it is a good plan, and the one which should be always adopted in every shop, but it is old and in commen use in many places.

"W. McP., of Ohio."—Parker claims two wheels on one shaft, and admitting the water with a circular whirling motion on the wheel.

"S. F., of N. Y."—The average leverage of the crank, three feet, would, by some, be held only 18 inches, but by others, and as we view it, it is one foot 11 6-8 inches leverage.

"E. A. G., of Georgia."—You are correct; the article in the A. M., credited to the "Farmer and Mechanic," is one of our editorials—our articles—we have "the copper coated with iron." The "Mechanic" did not do it *willingly*. The F. & M. always gets credit for the articles it takes from our columns,—it should in justice give us credit.

"H. A. D., of Vt."—There is no work upon the subject to which you refer.

"A. M. C., of Geo."—We shall be glad to hear from you at any time. You were mistaken in the estimates; the whole apparatus could not made complete for less than $800.

"W. J. F., of Pa."—Mr. Guthrie has no patent for self-setting saw mill dogs, that we know of We think his application was rejected. We have never seen a model of Mr. L.'s water wheel.

"H. C. L., of Pa."—L. & H. Churchill, of Rochester, N. Y., are the agents of Mr. Hibbard's invention.

"G. S. D., of N. Y."—We think Mr. H.'s movements very strange, and unless some party choose to contend with him he can collect damages. A jury might and might not award him damages under the circumstances. We do not know that any thing can be done to head him off.

"E. L., of N. C."—The suit you refer to we think has never been brought to a close. The patent has not yet been extended, and we are of the opinion that it will be doubtful about its success.

"J. H. C., of N. Y."—It appears to us that it could make the tin pill boxes superior and cheaperthan the plan now used for that purpose. A trial should be made at any rate,as you say, "if cheaper it is surely beneficial."

"P. H. W., of N. Y."—The process you describe appears to be new and good; the latter point, however, you can better decide by experiment. It is certainly patentable so far as we know.

"M. B. D., of Pa."—We have sought in vain for the specification of the process you refer to. It has never appeared in any of our foreign exchanges, and we intend to write our London Agents in regard to the matter. If we should hear any thing favorable we shall publish it.

"S. K., of Ind;"—We shall write you upon the receipt of those papers from the Patent Office, or as soon as we can have time to examine them.

"B.F.G. Jr., of N.Y."—An over-shot wheel would undoubtedly be best under the circumstances. The fair will probably last two weeks.

"A. G., of N. Y."—The Marine Engine is condensing and the average pressure is 10 lbs. to the square inch; stationary high pressure, carry 100 lbs., but there is no average—no general rule; from 30 to 100 is carried. Locomotives work from 70 to 100 lbs. on the square inch.

"J. A. S., of Me."—You ask "how a horse power of a steam engine is reckoned—what it is calculated to do in a given time." It is a mechanical force that will raise 33,000 lbs. one foot high in a minute. Take the pressure of steam on the area of the piston, the velocity, and divide by 33,000 for the horse power, deduct one-tenth for friction.

"H. P. C., of Mass."—We have not the first half of the fourth volume. We have been out of the back volumes for some time.

"J. H., of N. J."—we cannot give you the cost of the water pipes. You had better address Mr. Mayer, 139 Front street, this city, agents.

"E. C., of Ct."—We cannot tell you the price of the zinc paint—but think it can be obtained of the Sussex Zinc Co., corner of Nassau and Liberty streets.

"T. T. L., of Ohio."—The Alcott Lathe is not calculated to turn spokes.

"C. L. L., of Pa."—We do not charge for such advice as you want.

"W. C. H., of Geo."—We have been informed that Messrs. C. & O. manufacture good mills, but we never saw one of them. Sometime since we wrote them for information, as several inquiries had been made of us,—we have not heard anything from them in reply. One man can operate a shingle machine of the smallest size. A one horse power would be sufficient at any rate.

"W. D. C., of N. Y."—You will ascertain all the information sought for by addressing Mr. Wylie. We have never seen his boilers.

"W. S., of Pa."—We do not think it would be economical to purchase apparatus for making gas for a private family. Dr. Gesner's would be the cheapest one in our knowledge. The "Camera" will be sent according to request and the papers will be sent to each subscriber as per your request.

"W. L. C., of N. Y."—We think your plates are new—and advise you to send a perfect one to this office for examination.

"R. M., of Ohio."—Your paddle wheel is not new, we have seen models constructed exactly like it.

Money received on account of Patent Office business, since Sept. 17, 1850 :—

J. P., of Ky., $30; D. R. H., of Mass., $30; S. A. M., of N. Y., $40; G. W. H., of N. Y., $10; V. H. & N. H., of N. Y., $30; J. & B., of Vt., $30, and L. & R., of N. Y., $30.

To Correspondents.

We have not a few articles abiding their time; our pile has been somewhat large. One article on the Water Light, one on Steam and Water Power, one on Gravitation, and various others, are awaiting their due course. We will try and find room as soon as possible for all that is useful.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fees for copying.

ADVERTISEMENTS.

Terms of Advertising:

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them for any price.

PROSSER'S PATENT LAP-WELDED Boiler Tubes—Diameter, Number and Length of each at date :—

Inches.	In Stock.		Afloat.
1 1-4	1193	7-0	——
1 1-2	204	10-6	——
2	215	10-0	——
2	1052	12-0	721
2	349	14-0	——
2	1161	15-0	700
2	55	4-9	——
2	77	4-10 1-2	——
2 1-4	758	15-0	——
2 1-2	454	15-0	210
2 3-4	248	15-0	180
3	259	15-0	——
4	4	15-0	——
5	1	15-0	——
6	14	15-0	——

THOS. PROSSER & SON, Patentees,
September 24, 1850. 28 Platt st., New York.

Patent Office.
128 FULTON ST.

NOTICE TO INVENTORS.—Inventors and others requiring protection by United States Letters Patent, are informed t at all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow and Payne, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fultonstreet, New York.

TO INVENTORS.—The subscriber wishes to purchase the whole or part of some new, useful and patentable article adapted to the use of housekeepers. Some labor-saving machine that can be introduced into any and every family; a patented article would be preferred. As this article will be sold principally in the States of Ohio, Kentucky and Indiana, it will not interfere with any sales in any other States. Any person having anything new in the housekeeping line, they wish to sell, will please address WILLIAM BURNET, No. 14 East Fourth st., Cincinnati, Ohio. No washing machines, churns or stoves, of any kind, wanted. No letters will be noticed unless the postage is paid. 2 2*

DUPLICATES OF DRAWINGS.—One hundred or more copies of the drawings required by the Patent Office, can be furnished at short notice, and upon reasonable terms, by MUNN & CO., Scientific American Office, who have made arrangements to duplicate drawings of machinery and inventions, at prices varying from ten cents per copy, upwards.

PATENT METALIC OIL FOR MACHINERY—Warranted not to gum. Manufactured under Cumberland Brothers patent (April 6th 1849), by C. E. de la Vergne & Co., Elizabethport, N. J. Transparent metalic, adapted to light bearings, spindles, &c., will last a quarter longer than pure sperm. For burning will be found superior. Fluid White Metalic, of the consistance of cream, to be used without wick and tube, adapted to the oiling of engines, shaftings, &c. will last twice as long as pure sperm oil. Hard White Metallic, to be used instead of tallow, will last three times as long; when used in cylinders, the packing must be renewed. Blue Metallic grease, prepared for greasing the inside of boilers when thoroughly cleaned, that the scale which afterwards collects may be removed with one third the usual time and expense. It is also adapted to the greasing of cog wheels; and for the axels of vehicles it has been found to last more than four times as long as any grease ever used for that purpose.

K NNEDY & GELSTON, Sole Agents,
50 3m No. 8 Pine st. New York.

LATHROP'S PREMIUM BEE PALACE.—This Palace is no patent, and no humbug, but for cheapness, neatness, simplicity, durability and perfect adaptation to every want of the Bee, and the interest and convenience of the owner, it has no equal. It has been tested by hundreds of swarms, and proved completely successful, for three years. It has taken a premium at three Fairs; a gold medal has been awarded it by the Mechanics Institute, of Chicago, Ill. It requires no care nor skill in the use of it—all may use it withsuccess. Millions of dollars may be saved annually in our country, which are now lost, by using this Palace for working that most profitable of all insects—the Honey Bee. Engravings, and a specification of this Palace, sufficient to enable any joiner to make it, will be sent by mail, free, to any one remitting $1 to the inventor, at La Salle, La Salle Co., Ill. D. LATHROP, 1 3*

A VALUABLE PATENT FOR SALE.—The subscriber offers for sale rights of territory for his patent drawing instrument, (patented Aug. 13, 1850,) commonly called Pentagraph or Delineating Instrument. This instrument is for the purpose of drawing in perspective. It finds a ready sale, especially among the ladies, for the drawing room. It can be made by any ingenious mechanic. For further particulars apply to the subscriber, if by letter, post-paid. ALLEN JUDD, Chicopee, Mass. 1 2*

IMPROVED STEAM ENGINE FOR SALE.—The subscriber has four of his improved steam engines of three and six horse power left for sale. They ard made of the best materials—steel piston rods, metalic packing, heavy iron frames, governors and pumps, all complete for $135 for a three, and $235 for a six horse power. Boilers will be furnished for each engine, if required, for $90 each. JAMES WYLIE, Engineer,
51 4* No. 2 Bethune Street, N. Y.

12 POWER PLANING MACHINES.—SCRANTON & PARSHLEY, New Haven, Conn., have now finishing off 12 power Planers that will plane 8 feet long, 27 inches wide and 24 inches high; these planers are of the first quality, are self-feeding every way; the table is worked by a rack and pinion; the bed is 12 feet long. With each planer there is a splining head and counter shaft, pullies and hangers. They weigh about 4000 lbs.; the price, boxed and ready to ship, is $625. Also 12 hand lathes, with back gear on iron shears, and legs 7 feet long, swing 20 inches, about 700 lbs. weight—$75. These lathes are of the first quality. tf

ALCOTT'S CONCENTRIC LATHES.—We have on hand a few of these celebrated Lathes, which the inventor informs us will execute superior work at the following rates :—

Windsor Chair Legs and Pillars, 1000 per 11 hours. Rods and Rounds, 2000; Hoe Handles, 800; Fork Handles, 500; Broom Handles, 1500, per 11 hours.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid). MUNN & CO.,
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Scientific Museum.

Scientific Memoranda.

The telegraph wire, which was laid down so successfully between England and France, and which was described in the Scientific American of last week, has been broken on the French coast, about 200 yards from the shore. The lead tube was found to be too soft for the rolling of the surge. This evil will no doubt be obviated—we live and learn.

Dr. Darling, of New York, is still astonishing the Glasgowegians, as we learn by the Daily Mail of the 6th September; he makes more noise there than he did here. His Biological experiments with some of the people of that city, have excited great surprise. He made one lady do just what he liked—such as sitting, sleeping, walking, talking, snuffing and sneezing.

Mr. Lassell, of Stanfield, near Liverpool, has discovered a second satelite of the planet Neptune. The discovery was made with a telescope of twenty feet focal length, which was made by himself, and is said to be the most powerful instrument in Great Britain.

A most interesting discovery is reported to have been made in Russia, between Dorpat and Norva, of a combustible as carboniferous and calefactory as coal. It is of a yellowish brown color, with white spots, and is the subject of much speculation, being said to be of a much earlier geological period than any known coal field. If this discovery is true, it will dispel some poetry of the Geologists. It is our opinion that some valuable discoveries will yet be made of a new fuel in the northern parts of this continent. It cannot be that nature has left that cold region destitute of fuel.

A huge bed-plate for the steamship Humbolt was cast last week at the Novelty Works of Messrs. Stillman, Allen & Co., this city. Forty tons of metal were used.

Part of the Turkish Mediterranean squadron are about to sail for England, and part for the United States—the latter being the longest cruise on record of ships belonging to the Sultan.

An experimental trip was recently made on the Grand Canal, Dublin, to illustrate the advantages of the application of steam as a propelling power, by the agency of the screw, to boats and vessels engaged in inland navigation, and the result of which seemed highly satisfactory to numerous scientific persons and others who attended to witness it. Almost all the coasting vessels in Britain are arming themselves with the auxiliary screw.

Dr. Dick, of Scotland, at the Peace Congress in Germany, paid a high compliment to the liberality of a publishing house in Philadelphia. He thanked America for her kindness to him.

That immense apron of rock, being a flat sheet about thirty feet wide by one hundred and fifty feet long, over which the water of the falls of St. Anthony lately poured, next to the western shore, fell down not long since under the weight af the flood.

Idiocy---Opium.

Dr. Enos Stevens Examining Agent for the Massachusetts Commissioners for the prevention and cure of idiocy has a manuscript work wherein occurs the following;—

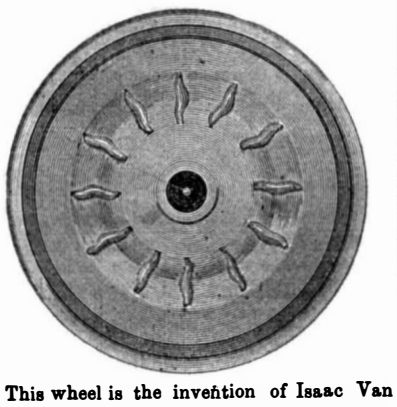
"At Cambridge Poor House, there are three well formed and strong brothers, whose names are Joseph Cox, 23 years old, George Cox, 20, and William Cox, 18. These are all the children their mother had. Their father was a respectable mechanic, and has a very intelligent child by a second wife. The mother of these idiotic boys was a most devotedly benevolent woman, who often took narcotic drugs, and went out whole days and nights to visit and assist the sick among her neighbors; leaving her own children all put asleep by laudanum, (which is wine and opium.) Every day when they cried, and every time she wished to go out, she put them all asleep with laudanum. At length, their whole organization assimilated to such a state of body and mind, and they have grown up to the size of manhood, with the avenues of their brains practically closed by drugs; so that they have merely infantile powers of mind, and strength of bodies."

* * "Among the 240 idiots described by the Commissioners to the Legislature of Massachusetts, seven seem to have been made so by their mothers trying to procure abortion by using very powerful drugs. Although these unborn children were not thus quite killed, yet they were irrecoverably stupified and mal-formed to the lowest degrees of both mental and animal idiocy and weakness. Indeed, these children remain glaring, crawling and howling, personifications of crime, misery and long continued corruption and death. In some of these cases, the health of the women was ruined for the remainder of their lives, and they ever after continued to bring forth idiots, mal-formations and invalids.

No woman can be devotedly benevolent who gives her children laudanum to keep them quiet."

Van Kuran's Patent Railroad Car Wheel.

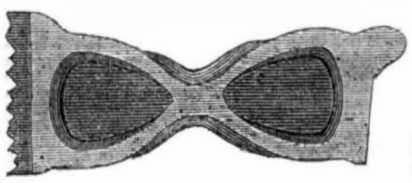
Fig. 1.



This wheel is the invention of Isaac Van Kuran, Esq, engineer, formerly Superintendent of the Railroad Machine Shop of the Auburn and Rochester Railroad, at Rochester, but who is now residing in Boston. It was patented on the first day of May, 1849, and since that time its success has been proverbial, and its adoption by various railroad companies is eminently gratifying, both as a matter of endorsement to the goodness of the wheel, and the profitableness of its manufacture.

Figure 1 is a front side view of the wheel, and figure 2 is a vertical transverse section through the centre of the same. These engravings will show, to all those engaged in the use and construction of car-wheels, the form and principle of this one. The nature of the improvement is in casting the wheel with a rim of the form of a semi-ellipsis, and of an oblate spheroid form at the hub part, with braces on either side, in such a manner as to strengthen the same, and remove all danger of breakage from cooling, and cause the

Fig. 2.



pressure and strain exerted on the hub to be more equally divided over the several parts of the wheel, than in the ordinary form of the car wheels now in use. The hub is cast solid with the other parts of the wheel; from the hub the leaves are oblate spheroidal formed shells, with openings on the side, to take out the core. The rim of the wheel is chilled, and resembles, in cross section, the form of a semi-ellipsis, and has a solid body of metal between the edge and the hollow part. The wheel is held to be light and strong, owing to its peculiar form and braces. The following is Mr. Van Kuran's claim:—

"I claim, as my invention, casting railroad car wheels with a rim of the form of a semi-ellipsis, and of an oblate sphereidal near the centre, the hub being cast solid with the same, with braces of the form of cima-reversa and cima-rectas formed in the valley between the rim and oblate spheroidal shell surrounding the hub, arranged in contrary directions on either side, in the manner and for the purpose herein set forth."

These wheels are now manufactured at the Boston Locomotive Works, 380 Harrison Avenue, Boston, superior to any cast wheels now in use, and can be furnished in any quantity.

More information may be obtained by letter addressed to Mr Van Kuran, or to David F. Childs, Prest.

How to Lengthen a Leg.

A recent number of the Medical Gazette gives the details of a case of great interest, an un-united fracture of the tibia of twenty-four years' standing successfully treated by Mr. Tamplin, the surgeon of the Orthopœdic Hospital. At the age of fourteen months a young lady received an injury to one of her legs, by slipping between the bars of a garden seat. The full extent of the injury was not discovered till some time after, when most painful symptoms disclosed themselves. Surgeons of eminence were consulted, but no effectual relief was obtained; amputation was recommended; and when Mr. Tamplin was first consulted, in 1849, the leg was two inches and a half shorter than the other. The system of extension, which had been so successfully applied at the Orthopœdic Hospital to other cases, was applied by Mr. Tamplin in this case, and it became necessary to divide the tendo-achillis. A steady continued pressure was kept up on the tibia above the point of fracture, and counter-pressure at the back of the leg just above the ankle joint. The results of this treatment were most satisfactory. The leg became gradually elongated and the patient was, in April last, in the presence of Mr. Travers and Mr. Lawrence, enabled to stand and walk without aid, and without a sign of motion at the point of the fracture.

Trees of the South.

Texas produces the pecan; Louisiana the cypress, which is the tree of the State; Mississippi the magnolia; Florida the live oak; Georgia and North Carolina the yellow pine; South Carolina the palmetto, though we fear the structure of this beautiful tree would be impracticable for usefnl purposes. This is the finest specimen of the palm family indigenous to the United States.

This palm possesses a great and, to this country, an increasing value. It is the only tree produced in our forests which is not attacked by the *toredo navalis*, or ship worm, and as it is incorruptible in salt water, its value for submarine construction is almost incalculable.

Its leaves can be employed in the manufacture of hats, baskets, mats and many other purposes of domestic economy; the "cabbage," composed of the unexpanded embryo leaves, may be classed among the most delicious vegetables produced on our tables. It is, however, a wasteful luxury, as the tree always perishes when deprived of this part of its foliage.

Grows along the sea coast of Carolina and Georgia, confined to the neighborhood of salt water; preferring damp, rich soils. Flowers in June—July.

An Insect Scourge.

Galignani's Messenger says:—One of the finest valleys of Savoy has just fallen under a devastating scourge. A host of insects, which are confounded by the people with the locusts, alighted lately in the valley of the Isere, near Saint Piere d'Albigni. These herbivorous insects are a thousand times more destructive than the locust; they are crickets (*acidium.*) Their presence has been already marked by deplorable ravages in the crops of maize, which were at first remarkably promising. They increase and multiply in a most frightful manner; each of the females deposits in little holes in the ground several thousand eggs, which are soon hatched. When they have cleared one spot of every vestige of herbage, they proceed to another, and, unless efficacious measures are adopted, the whole of Savoy will be devastated. These insects are as much to be dreaded when dead as when living: for, if killed by a cold rain, their bodies exhale an infectious miasma, which caused epidemical diseases.

Caving in of Mines.

The roof of the coal mines at Pictou, Nova Scotia, have fallen in, to the extent of some fourteen acres.

Kanawha, Va., Salines.

There are about 150 wells bored for salt water at the above place; they vary from 4½ to 4 inches at the upper section, of from one to 200 feet; and then from 5 to 8 inches in diameter, from 500 to 1800 feet deep. There are several gas wells, one of which furnishes water for about 250 bushels of salt per day; it stands at 7° by the salt-ometer, graduated at 24, and it gives out gas enough to boil twice that amount into salt; and it has force enough, as it issues from the well, to spout the water from 40 to 100 feet high.

We are indebted to Hons. J. M. Berrien, Lewis Cass, W. H. Seward, A. Venable and C. H. Peaslee, for Congressional favors.

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